TCEQ Interoffice Memorandum

To: Tony Walker
Director, TCEQ Region 4, Dallas/Fort Worth
Alyssa Taylor
Special Assistant to the Regional Director, TCEQ Region 4, Dallas/Fort Worth

From: Jennifer McKinney, Ph.D.
Toxicology Division, Office of the Executive Director

Date: November 29, 2016

Subject: Toxicological Evaluation of Results from an Ambient Air Sample for Volatile Organic Compounds collected Downwind of Bluestone Natural Resources II, LLC – Byrl Hayworth CTB (Latitude 32.347450, Longitude -97.747039) near Granbury, Hood County, Texas

Sample Collected on October 5, 2016, Request Number 1610006 (Lab Sample 1610006-001)

Key Points

- Reported concentrations of target volatile organic compounds (VOCs) were either not detected or were detected below levels of short-term health and/or welfare concern.

Background

On October 5, 2016, a Texas Commission on Environmental Quality (TCEQ) Region 4 air investigator collected a 30-minute canister sample (Lab Sample 1610006-001) downwind of Bluestone Natural Resources II, LLC – Byrl Hayworth CTB near Granbury, Hood County, Texas (Latitude 32.347450, Longitude -97.747039). The investigator experienced moderate hydrocarbon and engine exhaust odors while sampling. Meteorological conditions measured at the site or nearest stationary ambient air monitoring site indicated that the ambient temperature was 92°F with a relative humidity of 51%, and winds were from the south southwest (200°) at 1.7-2.4 miles per hour. The sampling site was located within 0-100 feet from the possible emission sources (multiple sources). The nearest location where the public could have access was >501 feet from the possible emission sources. The sample was sent to the TCEQ laboratory in Austin, Texas, and analyzed for a range of VOCs. The list of the target analytes that were evaluated in this review is provided in Attachment A. The VOC concentrations were reported in parts per billion by volume (ppbv) (Attachment B and Table 1). Please note that the available canister technology and analysis method cannot capture and/or analyze for all chemicals.

Results and Evaluation

Reported VOC concentrations were compared to TCEQ's short-term health- and/or welfare-based air monitoring comparison values (AMCVs) (Table 1). Short-term AMCVs are guidelines used to evaluate ambient concentrations of a chemical in air and to determine its potential to result in adverse health effects, adverse vegetative effects, or odors. Health AMCVs are set to provide a margin of safety and are set well below levels at which adverse health effects are reported in the scientific literature. If a chemical concentration in ambient air is less than its comparison value, no adverse health effects are expected to occur. If a chemical concentration exceeds its comparison value it does not necessarily mean that adverse effects will occur, but rather that further evaluation is warranted.

All of the 84 VOCs were either not detected or were detected below their respective short-term AMCVs. Exposure to levels of VOCs measured in this sample would not be expected to cause short-term adverse health effects, adverse vegetative effects, or odors.

Please call me at (512) 239-1785 you have any questions regarding this evaluation.

Attachment A

List of Target Analytes for Canister Samples

ethane	4-methyl-1-pentene	t-1,3-dichloropropylene
ethylene	1,1-dichloroethane	1,1,2-trichloroethane
acetylene	cyclopentane	2,3,4-trimethylpentane
propane	2,3-dimethylbutane	toluene
propylene	2-methylpentane	2-methylheptane
dichlorodifluoromethane	3-methylpentane	3-methylheptane
methyl chloride	2-methyl-1-pentene + 1-hexene	1,2-dibromoethane
isobutane	n-hexane	n-octane
vinyl chloride	chloroform	tetrachloroethylene
1-butene	t-2-hexene	chlorobenzene
1,3-butadiene	c-2-hexene	ethylbenzene
n-butane	1,2-dichloroethane	m & p-xylene
t-2-butene	methylcyclopentane	styrene
bromomethane	2,4-dimethylpentane	1,1,2,2-tetrachloroethane
c-2-butene	1,1,1-trichloroethane	o-xylene
3-methyl-1-butene	benzene	n-nonane
isopentane	carbon tetrachloride	isopropylbenzene
trichlorofluoromethane	cyclohexane	n-propylbenzene
1-pentene	2-methylhexane	m-ethyltoluene
n-pentane	2,3-dimethylpentane	p-ethyltoluene
isoprene	3-methylhexane	1,3,5-trimethylbenzene
t-2-pentene	1,2-dichloropropane	o-ethyltoluene
1,1-dichloroethylene	trichloroethylene	1,2,4-trimethylbenzene
c-2-pentene	2,2,4-trimethylpentane	n-decane
methylene chloride	2-chloropentane	1,2,3-trimethylbenzene
2-methyl-2-butene	n-heptane	m-diethylbenzene
2,2-dimethylbutane	c-1,3-dichloropropylene	p-diethylbenzene
cyclopentene	methylcyclohexane	n-undecane

Attachment B

11/2/2016

Texas Commission on Environmental Quality

Laboratory and Quality Assurance Section
P.O. Box 13087, MC-165
Austin, Texas 78711-3087
(512) 239-1716

Laboratory Analysis Results

Request Number: 1610006

Request Lead:Frank Martinez Region:T04 Date Received: 10/11/2016

Project(s): NA

Facility(ies) Sampled	City	County	Facility Type
Bluestone Natural Resources II, LLC - Byrl Hayworth C	Granbury	Hood	

Sample(s) Received

Field ID Number: N1716-167-1016 Laboratory Sample Number: 1610006-001 Sampled by: Aimi Tanada
Sampling Site: Downwind sample of leaking condensate and pr Date & Time Sampled: 10/05/16 12:24:00 Valid Sample: Yes
Comments: Canister N1716 was used to collect a 30-minute downwind sample using OFC-167. Full facility site information :Bluestone Natural Resources II, LLC- Byrl Hayworth CTB. Full sampling site information: Downwind sample of leaking condensate & produced water tanks.

Requested Laboratory Procedure(s):

Analysis: AP001VOC
Determination of VOCs in Canisters by GC/MS Using Modified Method TO-15

Please note that this analytical technique is not capable of measuring all compounds which might have adverse health effects. For questions on the analytical procedures please contact the laboratory manager at (512) 239-1716. For an update on the health effects evaluation of these data, please contact the Toxicology Division at (512) 239-1795.

Analyst: A Mathew Date: 11/2/16
Anita Mathew

Laboratory Manager: Frank Martinez Date: 11/2/16 11/2/16
Frank Martinez

Laboratory Analysis Results

Request Number: 1610006

Analysis Code: AP001VOC

Note: Results are reported in units of ppbv

Lab ID	1610006-001									
Field ID	N1716-167-1016									
Canister ID	N1716									
Compound	Conc.	SDL	SQL	Analysis Date	Flags**	Conc.	SDL	SQL	Analysis Date	Flags**
ethane	11000	50	120	10/15/2016	T,D3					
ethylene	ND	1.0	2.4	10/13/2016	T,D1					
acetylene	ND	1.0	2.4	10/13/2016	T,D1					
propane	3800	20	48	10/15/2016	T,D2					
propylene	ND	1.0	2.4	10/13/2016	T,D1					
dichlorodifluoromethane	0.40	0.40	1.2	10/13/2016	L,D1					
methyl chloride	0.55	0.40	1.2	10/13/2016	L,D1					
isobutane	440	9.2	48	10/15/2016	D2					
vinyl chloride	ND	0.34	1.2	10/13/2016	D1					
1-butene	ND	0.40	1.2	10/13/2016	D1					
1,3-butadiene	ND	0.54	1.2	10/13/2016	D1					
n-butane	1200	8.0	48	10/15/2016	D2					
t-2-butene	ND	0.36	1.2	10/13/2016	D1					
bromomethane	0.01	0.54	1.2	10/13/2016	J,D1					
c-2-butene	ND	0.54	1.2	10/13/2016	D1					
3-methyl-1-butene	ND	0.46	1.2	10/13/2016	D1					
isopentane	320	11	96	10/15/2016	D2					
trichlorofluoromethane	0.20	0.58	1.2	10/13/2016	J,D1					
1-pentene	ND	0.54	1.2	10/13/2016	D1					
n-pentane	410	11	96	10/15/2016	D2					
isoprene	1.1	0.54	1.2	10/13/2016	L,D1					
t-2-pentene	ND	0.54	2.4	10/13/2016	D1					
1,1-dichloroethylene	ND	0.36	1.2	10/13/2016	D1					
c-2-pentene	ND	0.50	2.4	10/13/2016	D1					
methylene chloride	0.04	0.28	1.2	10/13/2016	J,D1					
2-methyl-2-butene	ND	0.46	1.2	10/13/2016	D1					
2,2-dimethylbutane	6.8	0.42	1.2	10/13/2016	D1					
cyclopentene	ND	0.40	1.2	10/13/2016	D1					
4-methyl-1-pentene	ND	0.44	2.4	10/13/2016	D1					
1,1-dichloroethane	ND	0.38	1.2	10/13/2016	D1					
cyclopentane	11	0.54	1.2	10/13/2016	D1					
2,3-dimethylbutane	15	0.56	2.4	10/13/2016	D1					
2-methylpentane	120	11	24	10/15/2016	D2					
3-methylpentane	71	9.2	24	10/15/2016	D2					
2-methyl-1-pentene + 1-hexene	ND	0.40	4.8	10/13/2016	D1					
n-hexane	180	8.0	48	10/15/2016	D2					
chloroform	ND	0.42	1.2	10/13/2016	D1					
t-2-hexene	ND	0.54	2.4	10/13/2016	D1					
c-2-hexene	ND	0.54	2.4	10/13/2016	D1					
1,2-dichloroethane	ND	0.54	1.2	10/13/2016	D1					
methylcyclopentane	41	1.1	4.8	10/26/2016	D4					
2,4-dimethylpentane	8.2	0.54	2.4	10/13/2016	D1					
1,I,1-trichloroethane	0.01	0.52	1.2	10/13/2016	J,D1					
benzene	8.6	0.54	1.2	10/13/2016	D1					
carbon tetrachloride	0.07	0.54	1.2	10/13/2016	J,D1					
cyclohexane	48	9.6	24	10/15/2016	D2					
2-methylhexane	57	11	24	10/15/2016	D2					
2,3-dimethylpentane	14	0.52	1.2	10/13/2016	D1					

Laboratory Analysis Results

Request Number: 1610006

Analysis Code: AP001VOC

Note: Results are reported in units of ppbv

Lab ID	1610006-001									
Compound	Conc.	SDL	SQL	Analysis Date	Flags**	Conc.	SDL	SQL	Analysis Date	Flags**
3-methylhexane	58	8.0	24	10/15/2016	D2					
1,2-dichloropropane	0.58	0.34	1.2	10/13/2016	L,D1					
trichloroethylene	ND	0.58	1.2	10/13/2016	D1					
2,2,4-trimethylpentane	ND	0.48	1.2	10/13/2016	D1					
2-chloropentane	ND	0.54	1.2	10/13/2016	D1					
n-heptane	110	10	48	10/15/2016	D2					
c-1,3-dichloropropylene	ND	0.40	1.2	10/13/2016	D1					
methylcyclohexane	69	10	48	10/15/2016	D2					
t-1,3-dichloropropylene	ND	0.40	1.2	10/13/2016	D1					
1,1,2-trichloroethane	ND	0.42	1.2	10/13/2016	D1					
2,3,4-trimethylpentane	0.62	0.48	2.4	10/13/2016	L,D1					
toluene	41	11	24	10/15/2016	D2					
2-methylheptane	56	1.6	9.7	10/28/2016	D5					
3-methylheptane	35	0.93	4.8	10/26/2016	D4					
1,2-dibromoethane	ND	0.40	1.2	10/13/2016	D1					
n-octane	71	1.5	9.7	10/28/2016	D5					
tetrachloroethylene	ND	0.48	1.2	10/13/2016	D1					
chlorobenzene	ND	0.54	1.2	10/13/2016	D1					
ethylbenzene	2.1	0.54	2.4	10/13/2016	L,D1					
m & p-xylene	24	0.54	4.8	10/13/2016	D1					
styrene	ND	0.54	2.4	10/13/2016	D1					
1,1,2,2-tetrachloroethane	ND	0.40	1.2	10/13/2016	D1					
o-xylene	3.7	0.54	2.4	10/13/2016	D1					
n-nonane	25	0.89	2.4	10/26/2016	D4					
isopropylbenzene	ND	0.48	1.2	10/13/2016	D1					
n-propylbenzene	0.46	0.54	1.2	10/13/2016	J,D1					
m-ethyltoluene	1.2	0.22	1.2	10/13/2016	D1					
p-ethyltoluene	0.44	0.32	2.4	10/13/2016	L,D1					
1,3,5-trimethylbenzene	2.1	0.50	2.4	10/13/2016	L,D1					
o-ethyltoluene	0.38	0.26	2.4	10/13/2016	L,D1					
1,2,4-trimethylbenzene	3.1	0.54	1.2	10/13/2016	D1					
n-decane	7.9	0.54	2.4	10/13/2016	D1					
1,2,3-trimethylbenzene	0.50	0.54	1.2	10/13/2016	J,D1					
m-diethylbenzene	ND	0.54	2.4	10/13/2016	D1					
p-diethylbenzene	ND	0.54	1.2	10/13/2016	D1					
n-undecane	2.2	0.54	2.4	10/13/2016	L,D1					

Laboratory Analysis Results

Request Number: 1610006

Analysis Code: AP001VOC

Qualifier Notes:

ND - not detected
NQ - concentration can not be quantified due to possible interferences or coelutions.
SDL - Sample Detection Limit (Limit of Detection adjusted for dilutions).
SQL - Sample Quantitation Limit (Limit of Quantitation adjusted for dilution).
INV - Invalid.
J - Reported concentration is below SDL.
L - Reported concentration is at or above the SDL and is below the lower limit of quantitation.
E - Reported concentration exceeds the upper limit of instrument calibration.
M - Result modified from previous result.
T- Data was not confirmed by a confirmational analysis. Compound and/or results is tentatively identified.
F - Established acceptance criteria was not met due to factors outside the laboratory's control.
H - Not all associated hold time specifications were met. Data may be biased.
C - Sample received with a missing or broken custody seal.
R - Sample received with a missing or incomplete chain of custody.
I - Sample received without a legible unique identifier.
G - Sample received in an improper container.
U - Sample received with insufficient sample volume.
W - Sample recevied with insufficient preservation.

Quality control notes for AP001VOC samples.

D1-Sample concentration was calculated using a dilution factor of 4.02.
D2-Sample concentration was calculated using a dilution factor of 80.4.
D3-Sample concentration was calculated using a dilution factor of 200.18.
D4-Sample concentration was calculated using a dilution factor of 8.08.
D5-Sample concentration was calculated using a dilution factor of 16.19.

TCEQ laboratory customer support may be reached at Frank.Martinez@tceq.texas.gov

Table 1. Comparison of Monitored Concentrations in Lab Sample 1610006-001 to TCEQ Short-Term AMCVs

Lab Sample ID	1610006-001					
Compound	**Odor AMCV (ppb_v)**	**Short-Term Health AMCV (ppb_v)**	**SQL (ppb_v)**	**Concentrations (ppb_v)**	**Flags**	**SDL (ppb_v)**
1,1,1-Trichloroethane	--	1,700	1.2	0.01	J,D1	0.52
1,1,2,2-Tetrachloroethane	--	10	1.2	ND	D1	0.4
1,1,2-Trichloroethane	--	100	1.2	ND	D1	0.42
1,1-Dichloroethane	--	1,000	1.2	ND	D1	0.38
1,1-Dichloroethylene	--	180	1.2	ND	D1	0.36
1,2,3-Trimethylbenzene	--	3000	1.2	0.5	J,D1	0.54
1,2,4-Trimethylbenzene	--	3000	1.2	3.1	D1	0.54
1,2-Dibromoethane	--	0.5	1.2	ND	D1	0.4
1,2-Dichloroethane	--	40	1.2	ND	D1	0.54
1,2-Dichloropropane	--	100	1.2	0.58	L,D1	0.34
1,3,5-Trimethylbenzene	--	3000	2.4	2.1	L,D1	0.5
1,3-Butadiene	230	1,700	1.2	ND	D1	0.54
1-Butene	--	27,000	1.2	ND	D1	0.4
1-Pentene	100	4,500	1.2	ND	D1	0.54
2,2,4-Trimethylpentane	--	750	1.2	ND	D1	0.48
2,2-Dimethylbutane (Neohexane)	--	1,000	1.2	6.8	D1	0.42
2,3,4-Trimethylpentane	--	750	2.4	0.62	L,D1	0.48
2,3-Dimethylbutane	--	990	2.4	15	D1	0.56
2,3-Dimethylpentane	--	850	1.2	14	D1	0.52
2,4-Dimethylpentane	--	850	2.4	8.2	D1	0.54
2-Chloropentane (as chloroethane)	--	240	1.2	ND	D1	0.54
2-Methyl-1-Pentene +1-Hexene	--	500	4.8	ND	D1	0.4
2-Methyl-2-Butene	--	4500	1.2	ND	D1	0.46
2-Methylheptane	--	750	9.7	56	D5	1.6

Lab Sample ID	1610006-001					
Compound	**Odor AMCV (ppb_v)**	**Short-Term Health AMCV (ppb_v)**	**SQL (ppb_v)**	**Concentrations (ppb_v)**	**Flags**	**SDL (ppb_v)**
2-Methylhexane	--	750	24	57	D2	11
2-Methylpentane (Isohexane)	--	850	24	120	D2	11
3-Methyl-1-Butene	100	8,000	1.2	ND	D1	0.46
3-Methylheptane	--	750	4.8	35	D4	0.93
3-Methylhexane	--	750	24	58	D2	8
3-Methylpentane	--	1,000	24	71	D2	9.2
4-Methyl-1-Pentene (as hexene)	--	500	2.4	ND	D1	0.44
Acetylene	--	25,000	2.4	ND	T,D1	1
Benzene	--	180	1.2	8.6	D1	0.54
Bromomethane (methyl bromide)	--	30	1.2	0.01	J,D1	0.54
c-1,3-Dichloropropylene	--	10	1.2	ND	D1	0.4
c-2-Butene	--	15,000	1.2	ND	D1	0.54
c-2-Hexene	--	500	2.4	ND	D1	0.54
c-2-Pentene	--	4,500	2.4	ND	D1	0.5
Carbon Tetrachloride	--	20	1.2	0.07	J,D1	0.54
Chlorobenzene (phenyl chloride)	--	100	1.2	ND	D1	0.54
Chloroform (trichloromethane)	--	20	1.2	ND	D1	0.42
Cyclohexane	--	1,000	24	48	D2	9.6
Cyclopentane	--	1,200	1.2	11	D1	0.54
Cyclopentene	--	2,900	1.2	ND	D1	0.4
Dichlorodifluoromethane	--	10,000	1.2	0.4	L,D1	0.4
Ethane	--	*Simple Asphyxiant	120	11000	T,D3	50
Ethylbenzene	--	20,000	2.4	2.1	L,D1	0.54
Ethylene	--	500,000	2.4	ND	T,D1	1
Isobutane	--	33,000	48	440	D2	9.2

Lab Sample ID	1610006-001					
Compound	**Odor AMCV (ppb_v)**	**Short-Term Health AMCV (ppb_v)**	**SQL (ppb_v)**	**Concentrations (ppb_v)**	**Flags**	**SDL (ppb_v)**
Isopentane (2-methylbutane)	--	68,000	96	320	D2	11
Isoprene	48	20	1.2	1.1	L,D1	0.54
Isopropylbenzene (cumene)	130	500	1.2	ND	D1	0.48
m & p-Xylene (as mixed isomers)	--	1,700	4.8	24	D1	0.54
m-Diethylbenzene	--	460	2.4	ND	D1	0.54
Methyl Chloride (chloromethane)	--	500	1.2	0.55	L,D1	0.4
Methylcyclohexane	--	4,000	48	69	D2	10
Methylcyclopentane	--	750	4.8	41	D4	1.1
Methylene Chloride (dichloromethane)	--	3,500	1.2	0.04	J,D1	0.28
m-Ethyltoluene	--	250	1.2	1.2	D1	0.22
n-Butane	--	92,000	48	1200	D2	8
n-Decane	--	1,750	2.4	7.9	D1	0.54
n-Heptane	--	850	48	110	D2	10
n-Hexane	--	1,800	48	180	D2	8
n-Nonane	--	2,000	2.4	25	D4	0.89
n-Octane	--	750	9.7	71	D5	1.5
n-Pentane	--	68,000	96	410	D2	11
n-Propylbenzene	--	500	1.2	0.46	J,D1	0.54
n-Undecane	--	550	2.4	2.2	L,D1	0.54
o-Ethyltoluene	--	250	2.4	0.38	L,D1	0.26
o-Xylene	--	1,700	2.4	3.7	D1	0.54
p-Diethylbenzene	--	460	1.2	ND	D1	0.54
p-Ethyltoluene	--	250	2.4	0.44	L,D1	0.32
Propane	--	*Simple Asphyxiant	48	3800	T,D2	20
Propylene	--	*Simple Asphyxiant	2.4	ND	T,D1	1

Lab Sample ID	1610006-001					
Compound	**Odor AMCV (ppb_v)**	**Short-Term Health AMCV (ppb_v)**	**SQL (ppb_v)**	**Concentrations (ppb_v)**	**Flags**	**SDL (ppb_v)**
Styrene	25	5,100	2.4	ND	D1	0.54
t-1,3-Dichloropropylene	--	10	1.2	ND	D1	0.4
t-2-Butene	--	15,000	1.2	ND	D1	0.36
t-2-Hexene	--	500	2.4	ND	D1	0.54
t-2-Pentene	--	4,500	2.4	ND	D1	0.54
Tetrachloroethylene	--	1,000	1.2	ND	D1	0.48
Toluene	--	4,000	24	41	D2	11
Trichloroethylene	--	100	1.2	ND	D1	0.58
Trichlorofluoromethane	--	10,000	1.2	0.2	J,D1	0.58
Vinyl Chloride	--	26,000	1.2	ND	D1	0.34

*A simple asphyxiant displaces air, lowering the partial pressure of oxygen and causing hypoxia at sufficiently high concentrations.
ppbv - Parts per billion by volume.
ND - Not detected.
NQ - Concentration can not be quantified due to possible interferences or coelutions.
SDL - Sample Detection Limit (Limit of Detection adjusted for dilution).
SQL – Sample Quantitation Limit (Limit of Quantitation adjusted for dilution).
INV - Invalid.
J - Reported concentration is below SDL.
L - Reported concentration is at or above the SDL and is below the lower limit of quantitation.
E - Reported concentration exceeds the upper limit of instrument calibration.
M - Result modified from previous result.
T - Data was not confirmed by a confirmational analysis. Data is tentatively identified.
F - Established acceptance criteria were not met due to factors outside the laboratory's control.
H – Not all associated hold time specifications were met. Data may be biased.
C - Sample received with a missing or broken custody seal.
R - Sample received with a missing or incomplete chain of custody.

I - Sample received without a legible unique identifier.
G - Sample received in an improper container.
U - Sample received with insufficient sample volume.
W - Sample received with insufficient preservation.
D1 - Sample concentration was calculated using a dilution factor of 4.02.
D2 - Sample concentration was calculated using a dilution factor of 80.4.
D3 - Sample concentration was calculated using a dilution factor of 200.18.
D4 - Sample concentration was calculated using a dilution factor of 8.08.
D5 - Sample concentration was calculated using a dilution factor of 16.19.

Table 2. TCEQ Long-Term Air Monitoring Comparison Values (AMCVs)

Please Note: The long-term AMCVs are provided for informational purposes only because it is scientifically inappropriate to compare short-term monitored values to the long-term AMCV.

Compound	Long-Term Health AMCV (ppb_v)	Compound	Long-Term Health AMCV (ppb_v)
1,1,1-Trichloroethane	940	Cyclopentane	120
1,1,2,2-Tetrachloroethane	1	Cyclopentene	290
1,1,2-Trichloroethane	10	Dichlorodifluoromethane	1,000
1,1-Dichloroethane	100	Ethane	*Simple Asphyxiant
1,1-Dichloroethylene	86	Ethylbenzene	450
1,2,3-Trimethylbenzene	37	Ethylene**	5,300
1,2,4-Trimethylbenzene	37	Isobutane	2,400
1,2-Dibromoethane	0.05	Isopentane (2-methylbutane)	8,000
1,2-Dichloroethane	1	Isoprene	2
1,2-Dichloropropane	10	Isopropylbenzene (cumene)	50
1,3,5-Trimethylbenzene	37	m & p-Xylene (as mixed isomers)	140
1,3-Butadiene	9.1	m-Diethylbenzene	46
1-Butene	2300	Methyl Chloride (chloromethane)	50
1-Pentene	210	Methylcyclohexane	400
2,2,4-Trimethylpentane	75	Methylcyclopentane	75
2,2-Dimethylbutane (Neohexane)	100	Methylene Chloride (dichloromethane)	100
2,3,4-Trimethylpentane	75	m-Ethyltoluene	25
2,3-Dimethylbutane	99	n-Butane	2,400
2,3-Dimethylpentane	85	n-Decane	175
2,4-Dimethylpentane	85	n-Heptane	85
2-Chloropentane (as chloroethane)	24	n-Hexane	190
2-Methyl-1-Pentene +1-Hexene	50	n-Nonane	200
2-Methyl-2-Butene	210	n-Octane	75

Compound	Long-Term Health AMCV (ppb_v)	Compound	Long-Term Health AMCV (ppb_v)
2-Methylheptane	75	n-Pentane	8,000
2-Methylhexane	75	n-Propylbenzene	50
2-Methylpentane (Isohexane)	85	n-Undecane	55
3-Methyl-1-Butene	800	o-Ethyltoluene	25
3-Methylheptane	75	o-Xylene	140
3-Methylhexane	75	p-Diethylbenzene	46
3-Methylpentane	100	p-Ethyltoluene	25
4-Methyl-1-Pentene (as hexene)	50	Propane	*Simple Asphyxiant
Acetylene	2,500	Propylene	*Simple Asphyxiant
Benzene	1.4	Styrene	110
Bromomethane (methyl bromide)	3	t-1,3-Dichloropropylene	1
c-1,3-Dichloropropylene	1	t-2-Butene	690
c-2-Butene	690	t-2-Hexene	50
c-2-Hexene	50	t-2-Pentene	210
c-2-Pentene	210	Tetrachloroethylene***	3.8
Carbon Tetrachloride	2	Toluene	1,100
Chlorobenzene (phenyl chloride)	10	Trichloroethylene	10
Chloroform (trichloromethane)	2	Trichlorofluoromethane	1,000
Cyclohexane	100	Vinyl Chloride	0.45

*A simple asphyxiant displaces air, lowering the partial pressure of oxygen and causing hypoxia at sufficiently high concentrations.
**Long-term vegetation AMCV for Ethylene is 30 ppb.
***Long-term vegetation AMCV for Tetrachloroethylene is 12 ppb.